UNITED STATES MARINE CORPS
MARINE CORPS DETACHMENT
U.S. ARMY ENGINEER CENTER
FORT LEONARD WOOD, MISSOURI 65473-5850

E-191303 MAY 98

LESSON PLAN

FORKLIFT OPERATIONS

INTRODUCTION

LEARNING OBJECTIVES:

1. TERMINAL LEARNING OBJECTIVES)

a. Provided a Tractor, Rubber tired, Articulated steering, Multipurpose, 644E (TRAM) and a training area, with the aid of references, operate the tractor in support of engineer operations in accordance with TM-09148A-14/4. Provided a Tractor Rubber tired, Articulated steering, Multipurpose, 644E (TRAM), attachments and necessary tools, with the aid of references, install each attachment in accordance with TM-09148A-14/4.

2. ENABLING LEARNING OBJECTIVES)

a. Given a description of a Tractor, Rubber tired, Articulated steering, Multipurpose, 644E (TRAM) characteristics, without the aid of references, mark each description in accordance with TM-09148A-14/4.

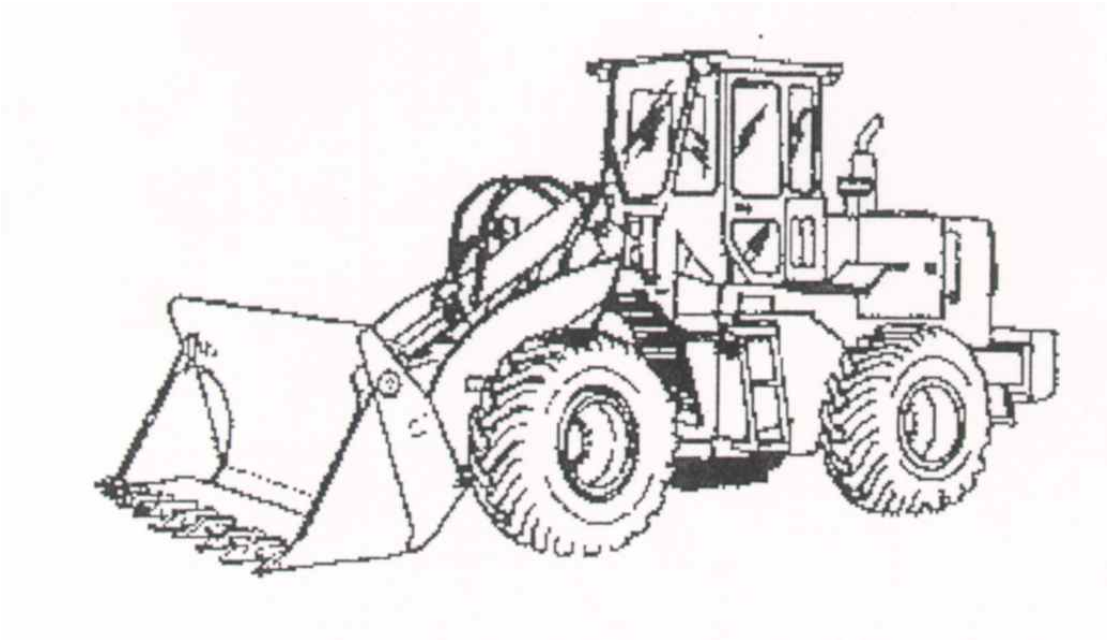
b. Provided a Tractor, Rubber tired, Articulated steering, Multipurpose, 644E (TRAM) equipped with the fork attachment, a simulated haul unit, and pallets, with the aid of references, load/unload the pallets onto/off of the haul unit in accordance with TM09148A-14/4.

c. Provided a Tractor, Rubber tired, Articulated steering, Multipurpose, 644E (TRAM) and attachments, without the aid or references, change attachments in accordance with. TM-09148A-14/4.

d. Provided a Tractor, Rubber tired, Articulated steering, Multipurpose, 644E (TRAM) and necessary tools, with the aid of references, perform before operation checks in accordance with TM-09148A-14/4.

e. Provided a Tractor, Rubber tired, Articulated steering, Multipurpose, 644E (TRAM) and necessary tools, with the aid of references, perform after operations checks in accordance with TM-09148A-14/4.

TRAM



644E

1. Characteristics & Capabilities

a. The TRAM 644E is a fully hydraulic, rough terrain forklift/loader manufactured by John Deere.

b. The TRAM is the largest forklift in the Marine Corps, with a gross vehicle weight of 35,790 pounds.

c. The TRAM is powered by a John Deere 6067, six-cylinder, turbocharged diesel engine, which has a maximum of 185 horsepower at 2200 RPMs.

d. The TRAM is equipped with a Powermatic transmission, which has four (4) speeds forward and three (3) speeds reverse.

(1) The transmission speed is selected manually by the operator.

(2) The maximum forward speed is 23.8 MPH.

(3) The maximum reverse speed is 15.3 MPH

e. The TRAM is full-time four wheel drive, and is equipped with a front axle differential lock.

(1) The TRAM can negotiate a maximum grade of 45%.

(2) The Tram has a maximum fording depth of 60 inches, and is equipped with an electric fan-disengage.

f. The front axle is rigid mounted.

g. The TRAM is equipped with an oscillating rear axle.

(1) The rear axle can oscillate 26 degrees

(2) The maximum ground clearance is 16.2 inches.

h. The TRAM can be equipped with either a forklift or 4-in-1 hydraulically controlled 2 1/2 cubic yard, multipurpose bucket attachment, arid has a pintle hook mounted on the rear of the tractor for

(1) The forklift attachment is electrically, as well as hydraulically operated.

(a) The maximum lifting capacity of the TRAM, when equipped with the forklift attachment, is 10,000 pounds.

(b) The maximum lifting height, of the TRAM, is 11 feet 1 inch (measured from the bottom of the fork tines, to the deck).

(c) The fork carriage can sideshift 12 inches, left or right from center.

(d) The fork tines can be adjusted for a maximum fork tine spread of 6 feet 4 inches (measured from the outside of the fork tines), and a minimum measurement of 18 inches (measured from the inside of the fork tines).

(e) The fork carriage can tilt forward 50 degrees, and 40 degrees to the rear.

(f) The fork carriage can oscillate 6.5 degrees left or right from center.

(2) The 4-in-1 bucket was designed to perform excavating and material handling operations.

(a) The maximum lifting capacity of the TRAM, when equipped with the bucket attachment is 7,500 pounds.

(b) The 4-in-1 bucket can be positioned in four (4) different operating modes.

1 Dozing

2 Scraping,

3 Bucket

4 Clamshell

i. The TRAM is equipped with a 24-volt negative ground electrical system.

DANGER!! Cigarettes, flames or sparks could cause battery to explode. Always shield eyes and face front battery. Do tot charge or use booster cables or adjust post connections without proper instruction and training. Keep vent caps tight acid level. Avoid metal-to-metal contact, i.e. ...watches, rings, and dog tags.

j. The TRAM has articulated type steering, it can articulate 40 degrees to the left and right from the center.

WARNING!! Do not stand on or near steps in area between tires when engine is running. No clearance for persons in this area when machine is turned. Machine can be turned even when engine is stopped.

k. The TRAM is equipped with a frame locking bar, which is utilized to prevent accidental steering during transporting, or when performing maintenance.

l. The TRAM is equipped with an automatic leveling/return to dig , and an automatic boom height kickout device.

m. The tractor is equipped with a fully enclosed cab and rollover protection structure (ROPS) to protect the operator.

CAUTION: Use seat belt when you operate with a roll-over protective structure (ROPS) to in minimize chance of injury front ail accident such as ail overturn.

Do not use seat belt if operating without a ROPS

n. The tractor is equipped with an electric air compressor for tire inflation.

o. The TRAM is equipped with a four-wheel, power-actuated brake system.

2. Mission: The mission of the TRAM 644E, with the fork attachment installed, is to load and unload palletized and containerized cargo from trucks, trailers, ships and aircraft. The mission of the TRAM 644E, with the bucket attachment installed, is to load haul units, and perform dozing, scraping, and clamshell operations.

3. Instruments & Controls: The following section provides illustrations and detailed information about the TRAM 644Es different instruments and controls.

a. The instrument panel, figure 1-1, is located directly in front of the operator on the steering console.

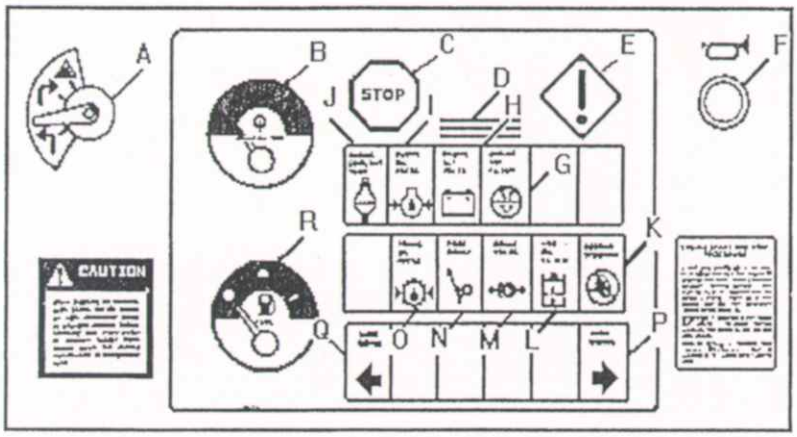


Figure 1-1

(1) TURN SIGNAL/EMERGENCY FLASHERS (A): Flipping the switch down from the horizontal neutral position activates the left turn signals. Flipping the switch up one (1) position from the horizontal neutral position activates the right turn signals. Flipping the switch up two (2) positions from the horizontal neutral position activates the Emergency Flashers.

(2) TRANSMISSION OIL TEMPERATURE GAUGE (B): Normal operating temperature is in the Green zone. If the transmission gauge needlepoints to the red zone, transmission oil temperature is too high. Reduce load by shifting to a lower gear. If the needle still stays in the red zone, stop the tractor and notify maintenance personnel.

(3) STOP INDICATOR (C): The stop engine indicator flashes and an alarm sounds when:

(a) Engine oil pressure is low.

(b) Engine coolant temperature is excessively high.

(c) Brake pressure is low.

(d) Transmission is shifted into gear with parking brake on.

(e) Steering system pressure is low, and secondary steering is activated.

IMPORTANT: If stop engine indicator flashes and alarm sounds, stop machine immediately and investigate cause of problem.

(4) AUDIBLE ALARM (D): This alarm will go off when the stop indicator light flashes.

(5) SERVICE REQUIRED INDICATOR (E): The service required indicator lights when:

(a) Alternator voltage is low.

(b) Engine air filter is restricted.

(c) Transmission oil pressure is low.

(d) Hydraulic oil filter is restricted.

(e) Parking brake is engaged with direction selector lever in neutral.

NOTE: If service required indicator lights, a problem is developing. It is not necessary to stop the engine, immediately, but the cause should be investigated as soon as possible.

(6) HORN BUTTON (F): Depressing this button causes the horn to sound.

(7) ENGINE AIR FILTER RESTRICTION INDICATOR (G): Indicator will light and service required indicator will light when air filter elements are restricted. Clean or change filter elements.

(8) ENGINE ALTERNATOR LOW VOLTAGE INDICATOR (H): Indicator will light and service required indicator will light when alternator output is low. Check battery charge or electrical system.

(9) ENGINE OIL LOW PRESSURE INDICATOR (I): Engine oil pressure indicator will light, stop engine indicator will flash, and alarm will sound when engine oil pressure is low. Stop machine and shut off engine immediately.

NOTE: Cold oil or extreme off level operation may cause indicator to light.

(10) ENGINE COOLANT HIGH TEMPERATURE INDICATOR (J): When engine coolant temperature is above 224 degrees, the engine coolant temperature will light, stop engine indicator will flash, and alarm will sound. Stop machine and shut off engine immediately.

(11) SECONDARY STEERING WARNING INDICATOR (K): Secondary steering indicator light will light, stop engine indicator will flash and alarm will sound when secondary steering system is actuated. Stop machine immediately. The secondary steering system is not intended for continuous use.

CAUTION: If engine failure occurs, the secondary steering system is activated. This system should run no longer that two (2) minutes or damage may occur.

(12) HYDRAULIC OIL FILTER RESTRICTION INDICATOR: Indicator will light and service required indicator will light when hydraulic filter element is restricted.

IMPORTANT: Change hydraulic oil filter as soon as possible to prevent damage.

(13) BRAKE OIL LOW PRESSURE INDICATOR (M): Brake pressure indicator will light, stop engine indicator will flash, and alarm will sound when brake pressure is low. Stop machine immediately.

IMPORTANT: If brake pressure light comes on while operating, stop machine immediately.

(14) PARKING BRAKE INDICATOR (N): If parking brake is engaged and the direction selector lever is in neutral, the service required light will light. If parking brake is engaged and the direction selector lever is in forward or reverse, the stop engine indicator will flash and alarm will sound.

(15) TRANSMISSION OIL LOW PRESSURE INDICATOR (0): Indicator will light and service required indicator will light when transmission oil pressure is low.

(16) RIGHT TURN SIGNAL INDICATOR (P): Indicator will light when right turn signal switch is engaged.

(17) LEFT TURN SIGNAL INDICATOR (Q): Indicator will light when left turn signal switch is engaged.

(18) FUEL GAUGE (R): The fuel gauge indicates the amount of fuel in the tank.

b. This control panel, figure 1-2, is located to the right of the operator's seat.

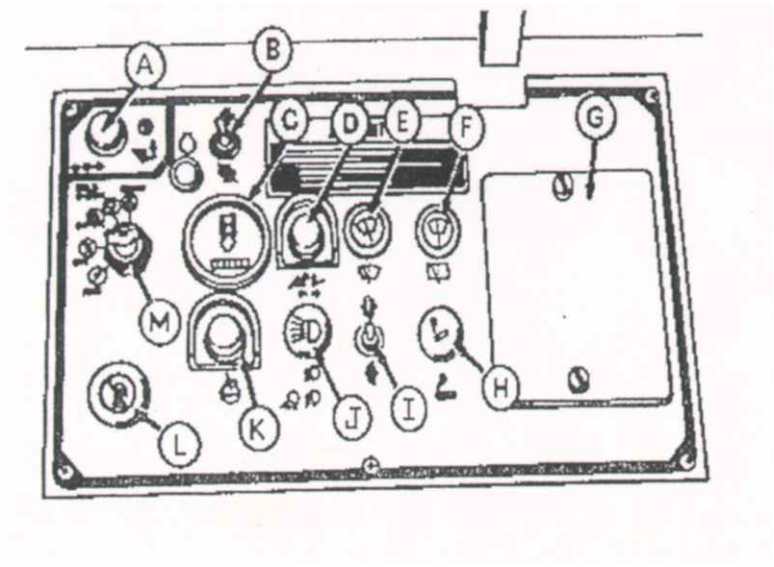


Figure 1-2

(1) BOOM DOWN SWITCH (A): This switch is used in conjunction with the right control lever to relieve hydraulic pressure in the circuits when removing the attachment from the machine.

NOTE: The engine must be shut OFF for this switch to work.

(2) FAN DISCONNECT SWITCH (B): Before fording, move the switch to the OFF position to disengage the fan. The yellow lamp (located beside the switch) will light, indicating the fan is off. Immediately after fording, move the switch back to the ON position. The yellow lamp will then go out indicating that the fan is engaged.

IMPORTANT: Failure to return the fan to normal operation will result in the engine overheating and could cause permanent damage to the engine.

IMPORTANT: Failure to disengage the fan while fording will cause damage to the blades and engine.

(3) HOUR METER (C): This gauge records the hours that the engine has operated, and determines when the machine needs periodic maintenance.

(4) PIN RETRACT SWITCH (D): This switch is used when changing the attachments on the TRAM. Pushing the switch down will retract the pins, and releasing the switch engages the pins.

(5) FRONT WIPER SWITCH (E): This switch activates the front windshield wipers.

(6) REAR WIPER SWITCH (F): This switch activates the rear windshield wipers.

(7) FUSE BOX (G): The fuse box contains both fuses and circuit breakers.

IMPORTANT: Install fuse with the correct amperage rating to prevent electrical system damage front overload.

(8) CIGARETTE LIGHTER (H): This is self explanatory.

NOTE: There is NO smoking on or around Engineer Equipment!

(9) CLUTCH CUT-OFFS WITCH (I): The clutch cut-off switch must be in the clutch disengaged position before the left brake pedal can be used to disengage transmission clutches. Flipping the switch up disengages the clutch. Use the clutch cut-off switch in situations such as truck loading where machine positioning and maximum hydraulics are needed.

CAUTION: When stopping on inclines, push clutch cut-off switch to engage position before releasing left service brake. This will prevent the loader from rolling downhill during transmission re-engagement cycle.

(10) LIGHT SWITCH (J): Pulling the light switch out to the first position will turn on the headlights, and the tail lights/brake lights. Pulling the light switch out to the second position turns on the front work lights, headlights, rear work lights, and tail lights/brake lights.

(11) START AID SWITCH (K): Depressing this switch releases starting fluid into the engine.

IMPORTANT: Use starting aid when temperatures are below -30 degrees F, and only when engine is cold.

IMPORTANT: Starting fluid is being injected into the engine as long as you push the button ONLY push when engine is cold and cranking; excess starting fluid could damage engine.

CAUTION: Injecting starting fluid into a warm engine may cause engine failure!!!

(12) FUEL SHUT-OFF (L): Pulling the fuel shut-off knob out shuts off the fuel supply to the engine. Do not release knob until engine stops completely.

IMPORTANT: Always pull fuel shut-off knob all the way out, to prevent electrical system damage.

(13) IGNITION SWITCH (M): This switch is used to start the equipment and to check the accessories. It is a five-position switch which has the following functions; OFF position, ON position, START position, ACCESSORY position, and BULB CHECK position.

c. The controls, figure 1-3, are your transmission control lever.

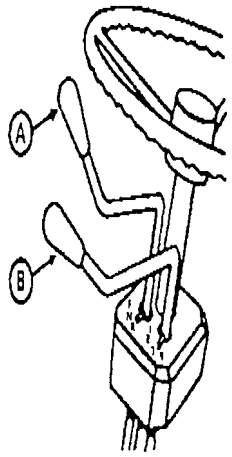


Figure 1-3

(1) DIRECTION SELECTOR LEVER (A): This lever has three (3) positions, FORWARD, NEUTRAL, and REVERSE, and allows the operator to change the direction of the machine.

(2) TRANSMISSION SHIFT LEVER (B): This lever has four positions and allows the operator to choose the desired speed. The machine has four (4) forward speeds and three (3) reverse speeds. Shifting to 4th speed reverse will give the same travel speed as 3rd speed reverse.

IMPORTANT: Do not change forward and reverse directions at high speeds to avoid damage to transmission. Come to a complete stop.

d. The controls, figure 1-4, are the pedals and steering column controls.

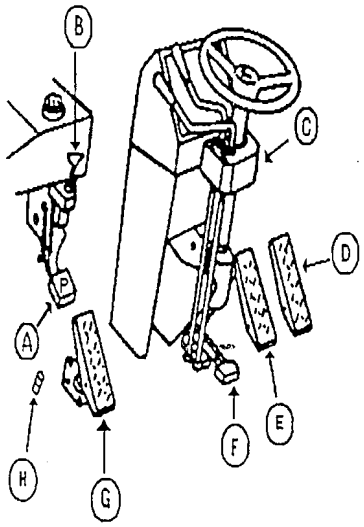


Figure 1-4

(1) PARKING BRAKE PEDAL (A): Push the brake pedal down to engage the parking brake.

NOTE: If parking brake is engaged when engine is running and direction selector lever is in neutral, the parking brake indicator and yellow caution indicator will be on.

If parking brake is engaged when engine is running and direction selector lever is moved to the forward or reverse position, the parking brake indicator and the red stop indicator will be on. The audible alarm will sound.

CAUTION: Never rely on the direction selector lever alone to keep machine from moving. Machine ca71 unexpectantly roll or move under power, resulting in death or serious injury. Always engage parking brake to hold machine.

(2) PARKING BRAKE RELEASE HANDLE (B): To disengage the parking brake, push the parking, brake pedal down and pull the parking brake release handle out. Release the pedal and the handle.

CAUTION: Before disengaging the parking brake, be sure engine is running and service brakes are operational.

(3) NEUTRAL LOCK (C): Push the neutral lock button in to lock the direction selector lever in neutral. Pull the neutral lock button out to unlock. IMPORTANT: Always move the direction selector lever to neutral and engage the neutral lock before starting or dismounting.

(4) ACCELERATOR PEDAL (D): Depressing this pedal increases the engines rpm's. Releasing the pedal decreases the rpm's.

(5) RIGHT BRAKE PEDAL (E): Depressing this pedal stops the machine

(6) STEERING COLUMN TILT PEDAL (F): Depressing this pedal allows the steering column to be tilted back towards the operator, or placed back in the upright position.

(7) LEFT BRAKE/CLUTCH CUT-OFF PEDAL (G): This pedal can be used to stop the machine, or can be used as a clutch cut-off pedal when the clutch cut-off switch is in the "clutch disengaged" position.

(8) DIFFERENTIAL LOCK SWITCH (H): Depressing the switch locks the front differential, releasing the switch unlocks the differential. Do not engage while wheels are spinning.

NOTE: Use the differential lock only when conditions require additional traction.

e. The following control, figure 1-5, is the lift/lower control of your carriage.

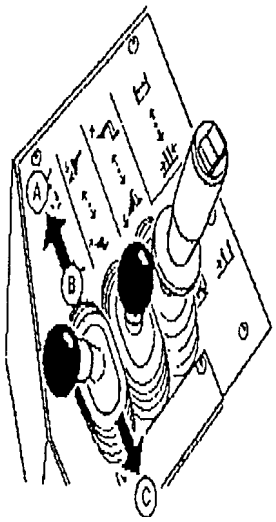


Figure 1-5

(1) Moving the left control lever to the full forward position, (A) allows the bucket/forks to float along the ground contours.

(2) Moving the left control lever to the forward position, (B) lowers the bucket/forks.

(3) Moving the left control lever to the rearward position, (C) raises the bucket/forks.

f. This control lever, figure 1-6, tilts forward or dumps and tilts rearward or rolls back.

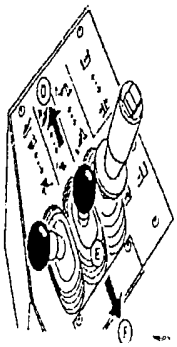


Figure 1-6

(1) Moving the middle control lever forward, (D) dumps the bucket, or tilts the forks forward.

(2) Moving the middle control lever rearward, (E) rolls back the bucket, or tilts the forks backward.

(3) Moving the middle control lever in the full rearward, (F) detent position (return to dig) returns the bucket to the set dig position.

g. The last control lever, figure 1-7, is the auxiliary control lever.

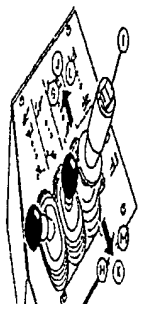


Figure 1-7

(1) Moving the right control lever forward, (G) opens the clamshell on the bucket, or spreads the forks apart.

(2) Moving the right control lever to the rear, (H) closes the clamshell, or moves the forks inward.

(3) The fork mode switch, (I) is a two (2) position switch used with the right control lever to operate the forks.

(4) Depressing the left side of the switch, (I) and moving the right control lever forward, (J) tilts the forks to the left.

(5) Depressing the left side of the switch, (I) and moving the right control lever rearward, (K) tilts the forks to the right.

(6) Depressing the right side of the switch, (I) and moving the right control lever forward (L) moves the fork carriage to the left.

(7) Depressing the right side of the switch, (I) and moving the right control lever rearward (M) moves the fork carriage to the right.

4. Basic Operations:

a. General Starting Procedures:

(1) Check instruments before starting by turning the master switch to the check bulb position.

(2) Fasten seat belt.

(3) Move direction lever to neutral. Engage neutral lock.

(4) Engage parking brake.

(5) Push fuel shut off in.

(6) Hold accelerator pedal down to one-third position.

(7) Turn master switch to ON.

IMPORTANT: Never operate starter motor for more than 20 seconds at a time. If engine fails to start after two or three tries, return key switch to OFF. Wait for about 2 minutes, then try again.

After a false start, do not turn key switch until engine stops or starter may be damaged.

Engine will not start by towing or pushing. Permanent damage to transmission will result.

(8) Turn key switch to start. Do not crank engine more than 20 seconds. Wait two minutes before trying again. Release switch when engine starts.

(9) Operate TRAM at less than normal loads and slow idle speed until engine warms up.

b. Cold Weather Starting Procedures:

CAUTION: Starting fluid is highly flammable. Keep container away from heat, sparks arid open flame. Contents are pressurized. Do not puncture or incinerate can.

IMPORTANT: Use starting aid whet temperatures are below -30 degrees F and only when engine is cold.

(1) Turn key to start position.

IMPORTANT: Starting fluid is being injected into engine as long as you push button ONLY when engine is cold and cranking; excess starting fluid could damage engine.

(2) Press switch 3 seconds to fill valve.

(3) Release switch to discharge shot.

c. General Stopping Procedures:

(1) Park machine on level surface.

(2) Lower attachment to ground.

NOTE: To lower boom with engine stopped, boon down switch must be pushed while pushing control lever forward.

(3) Move direction selector lever to neutral. Engage neutral lock.

(4) Engage park brake.

IMPORTANT: Turbocharger may be damaged if engine is not properly shut down.

(5) Run engine at half speed for two minutes before stopping to avoid damage to turbocharger. Release accelerator pedal to slow idle.

IMPORTANT: AL WAYS PULL FUEL SHUT-OFF KNOB ALL THE WA Y OUT, TO PREVENT electrical system damage.

(6) Pull fuel shut-off knob all the way out. Do not release knob until engine stops completely.

(7) Turn master switch OFF.

d. Employment

(1) Forklift Operations: In a garrison or field environment, the TRAM can be used for loading and unloading trailers, Air Force pallets, aircraft and ships.

IMPORTANT: DO NOT drag fork tips of the ground while traveling in the forward or reverse direction. Damage could result to the fork attachment.

(a) Insure the forklift is square to the load when positioning it to pickup a load or depositing a load.

(b) Use sideshift control to align forklift if needed.

(c) Use oscillation when loads or haul units are at an angle.

(d) Always carry a load against the fork carriage.

(e) Forks should be tilted back when carrying a stable load. Not all loads are to be considered stable, some loads need to be carried level.

(f) Carry the load 12-18 inches or as low to the ground as possible.

(g) Wide loads should be carried centered on the forks.

(h) When hauling bulky loads travel in reverse.

(i) When hauling a load up a steep grade travel forward with forks are titled back.

(j) When hauling a load down a steep grade travel in reverse with the forks titled back.

IMPORTANT: NEVER exceed the rate capacity of the forklift.

NEVER add extra counter weight.

NEVER add fork extensions.

(2) Bucket Operations

(a) Clamshell Procedures

1 Start the tractor.

2 Place the TRAM in the travel mode, using the following steps:

a Retract the bucket completely.

b Adjust the bucket 10 -14 inches above the ground.

3 Back up approximately 15 feet from the load to be picked up, so that the operator can see the entire load.

4 Pull forward and center the bucket on the middle of the load to be picked up, stopping approximately 5 feet from the load.

5 Pick-up (clam) the load, using the following steps:

a Level the bucket.

b Open the clam all the way.

c Lower the cutting edge to the ground, then raise it 1 to 2 inches off the deck.

d Move forward and make contact with the load, then lower the cutting edge until it is resting on the deck.

e Utilizing the de-clutch, close the clam.

f Retract the bucket completely.

g Back the TRAM approximately S feet and stop.

h Position the bucket 10 - 14 inches above the ground.

6 Maneuver the TRAM to the desired location, stopping approximately 5 feet from the placement location.

7 Place the load, using the following steps:

a Level the load.

b Move forward, approximately 5 feet, to the desired placement position.

c Lower the bucket until the load touches the deck.

d Fully open the clam.

e Raise the bucket high enough to clear the load, this ensures that all the material is out of the bucket.

f Back up approximately 5 feet and stop. g Close the clam.

8 Place the bucket in the traveling position.

9 Repeat steps 2 - 8 until the procedure is mastered.

10 Perform shutdown procedures.

(b) Excavation Procedures. Excavating with the TRAM can be accomplished by utilizing the following steps.

1 Determine a starting point for a ramp. The ramp should be approximately 8 feet from where the excavation will begin.

2 Adjust the bucket angle, using the following steps:

a Position the bucket so that the bucket is level on the deck.

b For hard material, raise the bucket approximately 5 inches off the deck and pitch the bucket forward until the teeth contact the deck.

c For soft material, raise the bucket approximately 3 inches off the deck and pitch the bucket forward until the teeth contact the deck.

3 With the transmission in forward, gradually penetrate the ground using the lift arm control lever.

4 Keep engine speed as high as possible, without causing the tires to spin excessively.

5 Regulate the depth of cut by using the lift arm control lever, while moving forward.

6 When you have reached the end of the excavation, stop the tractor and fully retract the bucket, by placing the bucket control lever in the retract position.

7 Place the lift arm control lever in the raise position until the bucket is high enough to clear the surrounding area.

8 Dump the material into the stockpile.

9 Repeat steps 2 - 8 until the excavation is completed.

(c) Stockpiling Procedures. Stockpiles may be constructed at the end of the excavation by using the following steps.

1 Move forward until the front tires contact the bank of the excavation.

2 Raise the bucket all the way up, utilizing the lift arm control lever.

3 Move the bucket control lever to the dump position and slowly dump the material, until the bucket is emptied.

4 Pull the bucket control lever all the way to the rear to engage the automatic leveling device, and level the bucket.

5 Utilizing the lift arm control lever, lower the bucket until it is 10 - 14 inches above the stockpile.

6 Back the TRAM approximately 5 feet from the stockpile and stop.

7 Lower the bucket to 10 - 14 inches off the deck.

8 Back the TRAM to the start of the work area.

9 Repeat these steps until the stockpile is constructed.

NOTE: Opt large excavations, haul units may be used to dispose of material not needed on the work site.

(d) Scraping Procedures. Scraping procedures can be accomplished using the following steps.

1 Raise the bucket 10 - 14 inches off the ground. .

2 Open the clam until there is approximately an 8 - 9 inch gap between the clam and the cutting edge.

3 Slightly retract the bucket, so that when the operator lowers the bucket to the deck, there is approximately a 4 inch gap between the bottom portion of the clamshell and the deck.

4 Lower the bucket to the deck, by utilizing the lift arm control lever.

5 Make the scraping pass by moving forward, adjusting the depth of cut with the lift arm control lever, until the desired distance has been reached.

6 When you have reached the desired distance, stop, press the de-clutch pedal and close the clam, utilizing the clam control lever. After this has been done, retract the bucket, then close the clam again.

7 If you are operating in a trench, raise the bucket high enough to clear the stockpile and dump the material on the stockpile, utilizing the stockpiling procedures. If you are not in a trench, transport the material to a stockpile, and dump it utilizing the stockpiling procedures.

8 Repeat these steps until the job is completed.

(e) Dozing Procedures. Dozing procedures can be used when leveling or backfilling trenches by using the following steps.

1 Bucket Set-up

a Raise the bucket to approximately 10 - 14 inches off the ground, and level the bucket.

b Using the clam control lever, fully open the clam.

c Place a slight retract on the bucket.

2 Backfilling

a Align the tractor with the stockpile, on either the left or right side.

b Lower the bucket to the deck, then raise it up approximately 1 - 2 inches.

c Using 1/3 of the bucket, at approximately a 45 degree angle, place the transmission in forward and as the cutting edge makes contact with the stockpile, lower it back down to the deck and gradually begin moving material.

d Keep engine speed as high as possible without causing the tires to spin excessively.

e As the front of the tractor enters the excavation, the operator needs to turn into the excavation and use the lift arm control lever to "LOWER" or "RAISE" the bucket to cut and spread the stockpile the length of the trench.

f Once the operator reaches the end of the trench, or runs out of material in front of the bucket, raise the bucket 10 - 14 inches off the ground and stop.

g Place the transmission in reverse and backup to the stockpile.

h Repeat these steps until the stockpile is leveled and the trench is filled in.

(f) Load a Haul Unit. Loading a haul unit can be accomplished once you have already achieved a load within the bucket, from one of the different ways we have already learned about.

1 Position the bucket 10-14 inches off the deck.

2 Center the bucket on the haul unit.

3 Pull within 5 feet of the haul unit.

4 Lift the bucket high enough to clear the haul unit.

5 Proceed slowly forward unitl the bucket is over the haul unit. DO NOT make contact with the haul unit with the front tires.

6 Dump the bucket by rolling the bucket forward slowly. DO NOT let the bucket hit the haul unit. Besides rolling the bucket forward you can also open the clamshell to empty the bucket. Your situation will dictate which method you will use.

7 Level the bucket.

8 Lower the bucket 10 to 14 inches above the haul unit and then back up to 5 feet from the haul unit.

9 Lower the bucket 10-14 inches from the deck.

10 Repeat the above steps until the haul unit is full.

e. Changing Attachments

(1) Removing Attachments

(a) Level attachment, bring to carrying height.

(b) Shut-off engine.

(c) Press boom down switch, operate auxiliary lever back and forth to relieve hydraulic pressure in the system. This will lower attachment to the ground.

(d) Dismount unit and uncouple the two hydraulic connectors. Mate the two fittings together on the attachment. Cap and plug the connectors on the forklift.

(e) Disconnect electric connector and cap the connectors.

WARNING: Unsupported fork may tip backward and cause crushing injury. Always block fork securely when removing from vehicle.

(f) Properly block attachment (This can either be done before shutting off engine in Step #2, by placing substantial weight on the tines or by placing blocking material, dunnage, under the rear part of the attachment.

(g) Start engine.

(h) Raise the boom until attachment is off the ground to prevent locking pins from binding on the attachment.

(i) Depress the pin retract switch and lower attachment to the ground. Bump the boom lever to jiggle the attachment until pins retract fully.

(j) Slowly back up machine until the lifting pintle disengages from the triangular alignment bar.

(2) Installing Attachments

(a) Pull forward, positioning machine so that the lift pintle engages the triangular alignment bar on the attachment.

IMPORTANT: Do not attempt to engage attachment with lock pins extended. Do not extend pits until attachment is completely off the ground and the pins are aligned with the pin bosses. Do not attempt to retract lock pins with attachment on ground.

(b) Depress the pin retract switch while raising the boom. As the forks begin to lift, the pins will align with the holes in the attachment frame.

(c) Release the pin retract switch and allow the pins to engage. Both pins must protrude approximately 3/8 of an inch beyond the pin bosses. (If pins do not fully extend in, it may be necessary to raise or lower the boom to jiggle the pins into position.)

(d) Connect the hydraulic fittings and the electrical plug.

(e) Perform a functions check, to ensure all of the controls work.

DAILY
BEFORE, DURING AND AFTER OPERATIONS
PMCS FOR EBFL

B = BEFORE OPERATIONS D = during Operations A = After operations

tem #	Coverage	Operation	Type	Responsibility
1	Damage, Pilferage, Loss	B,A	C	- Check for loose, missing or damaged parts
2	Leaks, General	B,A	C	- Check oil, fuel and water hoses, lines and reservoirs for any and all leaks.
3	Fuel, Oil Water	B,A	V,S	- Verify engine oil is at proper level on dipstick, add 15w40 if low, service again at end of operation.
				- Verify Hydraulic oil is between high and low in sight glass, add 10wt if low, service again at end of operation.
				- Verify Transmission oil is on dipstick prior to starting tractor, service again at end of operation
				- Verify coolant in radiator is at bottom of fillerneck, add 50/50 mix coolant and water if low, service again at end of operation
				- Verify fuel, inform instructor if below ¼ tank
				- Lubricate in accordance with LI at end of operation
4	Engine Warm-up	B	C	- Allow engine to run at low idle for 3 to 5 minutes to warm turbocharger.
5	Instruments	B,D	C	- Check instruments once vehicle is started
6	Safety Devices	B	C	- Check guards, shields, ROPS, covers and seat belts
7	Tools and Equipment	B	C	- Check for fire extinguisher and its charge
8	Publications	B	V	- Verify publications are available
9	Clutch	B,D	V	- Verify Transmission Disengage is operable once TRAM is started
10	Steering	B,D	C	- Check steering works in all modes
11	Engine Operation	D	C	- Check engine operation while running
12	Unusual Noises	B,D	C	- Listen for unusual noises from anywhere on the tractor
13	Lights and Reflectors	B	C	- Check all lights to include blinkers, hazards and flood
14	Air Tanks	/	/	-
15	Drive Belts	B	C	- Check for fraying, wearing and deflection no more than ¾”
16	Battery Elec. Level	B,A	C,S	- Check for electrical current, service if necessary
17	Antifreeze Test To	B	V	- Verify hydrometer reading, adjust if necessary
18	Service Brakes	B,D	V,C	- Verify brake pedal works properly
19	Transmission	B,D	C	- Check Transmission operation in all gears, and dipstick for accurate reading
20	Air Filter	B,A	V,S	- Verify air filter service indicator is not in red
21	Fuel Filter	/	/	-
22	Tires	B,A	C	- Check tires for thread wear, cuts, gouges, foreign objects and air pressure (60psi front and rear)

The above PMCS is in accordance with the back of the NAVMC 10523 and TM 09276A-10/1. The back of the NAVMC 10523 should be completed once the above services have been completed.

PERIODIC MAINTENANCE

INTERVAL HOURS	ITEM	#PER ITEM	DESCRIPTION	MATERIAL
As Required	4– Tires	4	Inspect and check pressure (50psi - front, 40psi – rear)	
	4- Wheel Bolts	4	Ensure all are tight	
	6- Pre-cleaner	1	Check and clean	
	9- Air Cleaner	1	Check and clean	
	11- Belts	2	Check and inspect tension (3/4 deflection)	
	13- Fuel Tank	1	Drain water and clean strainer	
	33- Fork Slides	4	Apply grease to bar s	GAA
10 or Daily	5- Coolant recovery tank	1	Check	Coolant/water
	16- Engine oil level	1	Check	15w40
	21- Hydraulic oil level	1	Check – Midway in sight glass	10wt
	23- Transmission oil level	1	Check – Warm	10wt
	27- Frame hinge pivots	2	Grease – Until it escapes around seals	GAA
	29- Front drive line support bearing	1	Grease – Until it escapes around seals	GAA
100	1- Loader Boom & cylinder pivots	15	Grease - Until it escapes around seals	GAA
	3- Front steering cylinder pivots	2	Grease – 3 shots	GAA
	12- Battery water level	2	Check – bottom of filler neck, clean & tighten terms	Water
	22- Cab fresh air filter	1	Clean – as required	
	24- Cab recirculating air filer	1	Check – clean as required	
	25- Oscillating rear axle	2	Grease – 10 shots	GAA
	25- Rear steering cylinder pivots	2	Grease – 3 shots	GAA
	28- Transmission to front differential telescoping shaft	1	Low pressure greasing – 5 shots	GAA
	31- coupler	2	Grease - Until it escapes around seals	GAA
	32- Multipurpose bucket	6	Grease - Until it escapes around seals	GAA
	33- Fork attachment	4	Grease - Until it escapes around seals	GAA
250	14- Radiator	1	Check	Coolant/Water
500	2- Transmission to differential drivelines	7	Low pressure greasing – until it escapes around all bearing caps	GAA
	7- Air intake hoses	1	Check – cracks and loose connections	
	20- Axle bearings	4	Grease with low pressure – 20 shots	GAA
	30- Front & rear differential oil level	2	Check	
1,000	Pintle hook	1	Grease - Until it escapes around seals	GAA

The above chart indicates all operators PMCS for the TRAM